- 5. Brown, M. E., Annu. Rev. Phytopathol., 1974, 12, 181.
- 6. Kundu, B. S., Studies on Azotobacter chroococcum and phosphomicroorganisms in relation to crop productivity. Ph.D. Thesis, IARI, New Delhi, 1979.
- 7. Lehri, L. K., Bajpai, P. D. and Tiwari, V. N., National Symposium on nonsymbiotic bacterial and algal mediated nitrogen fixation, IARI, New Delhi, 1978, 21.
- 8. Kundu, B. S. and Gaur, A. C. *Plant Soil*, 1980, 57, 223.
- 9. Ocampo, J. A., Barea, J. M. and Montoya, E., Can. J. Microbiol. 1975, 21, 1160.
- 10. Jackson, M. C., Soil chemical analysis, Prentice Hall, New Jersey, 1967.

## TWO NEW TAXA OF CURCUMA LINN. (ZINGIBERACEAE) FROM CANNANORE DISTRICT, KERALA, INDIA

R. ANSARI, V. J. NAIR AND N. C. NAIR Botanical Survey of India, Coimbatore 641 003, India

DURING a recent plant exploration tour in the early spring to the Cannanore District of Kerala State in South India, two interesting taxa of the genus Curcuma Linn. were found growing along road-sides and in fallow fields. The plants were critically studied with available literature and compared with all the herbarium specimens available in MH and CAL and were found to be quite distinct from all the other species of the genus reported from India. The plants were found to be allied to the Ceylon species, Curcuma albiflora Thw. However, on comparing with the specimens at Kew Herbarium, the present plants differed in many details. These represent two hitherto undescribed taxa and are described here as a new species and a new variety.

Curcuma cannanorensis R. Ansari, V. J. Nair and N. C. Nair sp. nov.

Curcuma albiflora Thw. affinis, sed differt foliis pusilloribus, apicibus foliorum acuminatis et apiculatis; petiolis laminis curtioribus; spicis curtioribus, floribus magnioribus.

Holotypus: Ansari 67822 (CAL); India, Kerala, Cannanore Dt., Karimbam, 175 m, 23-6-1980. Isotypi in MH.

Allied to Curcuma albiflora Thw., but differs in the smaller size of leaves with acuminate and apiculate apex; the petiole always shorter than lamina, the shorter spike and the larger size of flowers.

Tuberous herbs. Tubers 2 to 7, bearing at the ends of thick fibrous roots, 1.5-4 cm long, 0.5-1.5 cm thick,

oblong-ellipsoid, white inside. Basal sheaths lanceolate or oblanceolate, obtuse. Leaves 2-7 in a tuft; lamina 5-13 cm long, 2-6 cm broad, ovateelliptic, oblique at base, acuminate and apiculate; petiole shorter than lamina, 3-9 cm long, ca. 2 mm in diam., sheathed at the base. Inflorescence arising from the tuft of leaves; peduncle 2.5-6 cm long; spike 3-5 cm long, 1-2.5 cm in diam., without any distinct coma. Bracts all fertile or 1-2 sterile towards the tip, ca.  $2.7 \times$ 1.5 cm, lanceolate, obtuse, recurved at apex, adnate at base, green, 10-nerved. Bracteoles similar, ca. 1.1 $\times$ 0.6 cm, lanceolate. Flowers longer than bracts, ca. 4.5 cm long, 1.5-2 cm in diam., white. Calyx tube ca. 1.5 cm long; lobes subequal, ovate-triangular, mucronate puberulous outside. Corolla tube longer than bract, ca. 3 cm long, funnel shaped, pubescent and pinkish tinged outside; lobes subequal, ca.  $1.5 \times 0.7$  cm; dorsal lobe triangular-ovate, acuminate, hairy at the tip, white with a pinkish tinge. Staminodes ca.  $2.5 \times 1.2$ cm, oblong-long cuneate, obliquely truncate at apex, glabrous, white, minutely gland dotted. Lip ca.  $1.2 \times$ 1.2 cm, obovate, white with an yellow spot at the middle, deeply 2-lobed at apex; the sinus reaching more than half the length of lip; lobes oblong-cuneate. Filaments petaloid, ca.  $7 \times 4$  mm, oblong; anthers  $6 \times 3$ mm, oblong, spurred at base. Ovary oblong-obovoid, puberulous; stylodes linear; stigma capitate, ciliate.

Holotype: Ansari 67822 (CAL); INDIA, Kerala, Cannanore Dt., Karimbarn, 175 m, 23.6.1980. Isotypes in MH.

The specific spithet refers to Cannanore District, the place from where the new species was collected.

C. cannanorensis var. lutea R. Ansari, V. J. Nair and N. C. Nair var. nov.

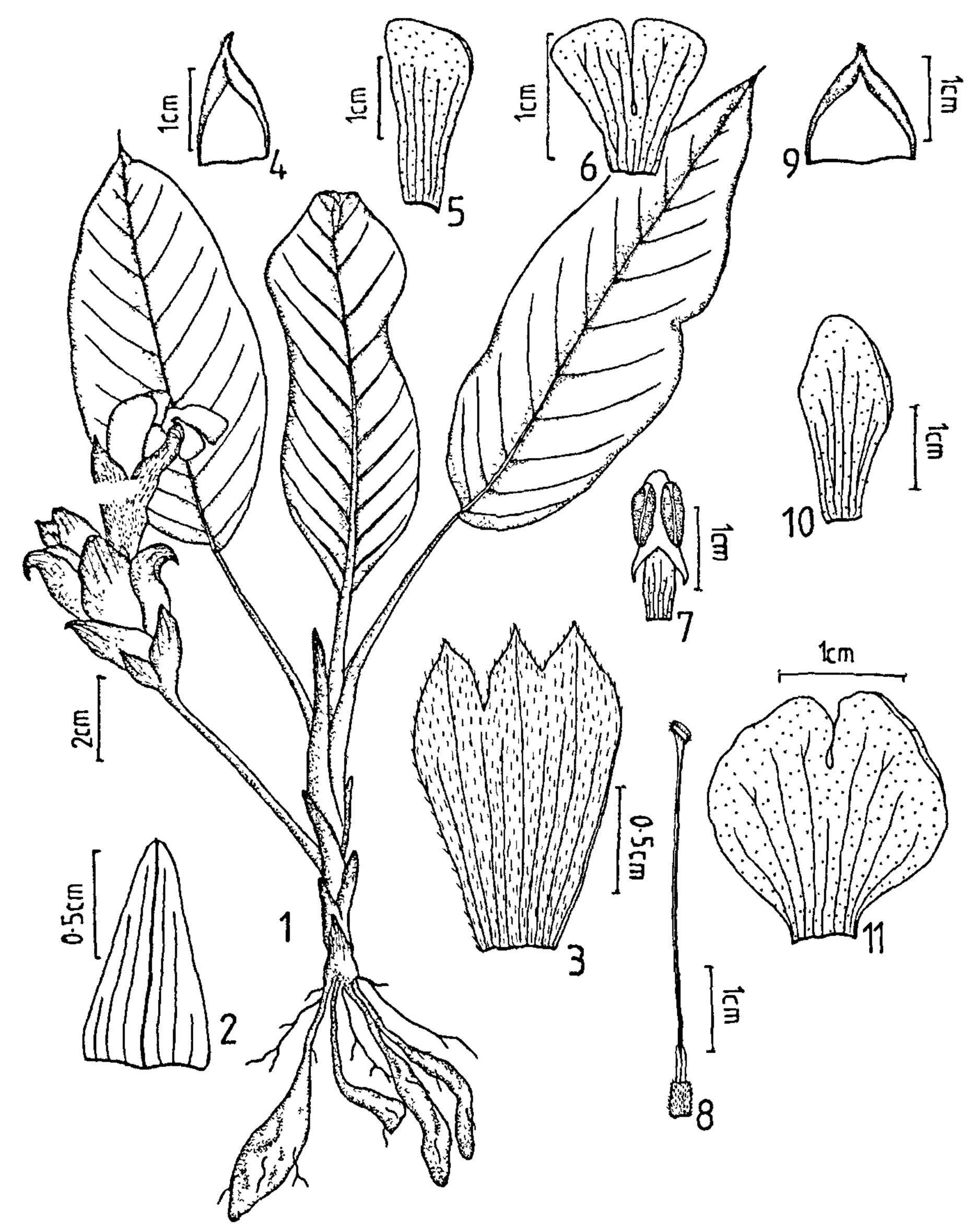
Differt a varietate typica in floribus luteis, lobis corollae latioribus (ca.  $1.5 \times 1.3$  cm); staminodiis oblanceolatis; labiis magnioribus (ca.  $2 \times 2$  cm); labio sinum supra medium haberti et lobis rotundatis.

Holotypus: Ansari 64999 (CAL); India, Kerala, Cannanore Dt., Kalliasseri, 125 m, 22-6-1980. Isotypi in MH.

Differs from the typical variety in the yellow colour of the flowers, the broader corolla lobes (ca.  $1.5 \times 1.3$  cm); the oblanceolate staminodes; the larger size of the lips (ca.  $2 \times 2$  cm) with the sinus less than half the length of the lip and the lobes rounded.

Holotype: Ansari 64999 (CAL), India, Kerala, Cannanore Dt., Kalliasseri, 125 m, 22-6-1980, Isotypes in MH.

The authors are thankful to Dr. R. Sundara Raghavan, Regional Botanist at the Herbarium, Royal Botanic Garden, Kew for comparing the plants with the specimens available there and for his valuable opinion.



Figures 1- 8, Curcuma cannanorensis R. Ansari, V. J. Nair & N. C. Nair 1. Habit; 2. Bracteole; 3. Calyx tube split; 4. Dorsal corolla lobe; 5. Staminode; 6. Lip; 7. Stamen; 8. Pis.il. 9-11, C. Cannanorensis var. lutea R. Ansari, V. J. Nair & N. C. Nair 9. Dorsal corolla lobe; 10. Staminode; 11. Lip.